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Effect of metal ions on the colorimetric determination of irreversible cholinesterase inhibitors

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Abstract

Colorimetric tests based on cholinesterase preparations stabilized by N-phthalylchitosan were developed. They determine organophosphorus irreversible inhibitors in the concentration range n × 10-8-n × 10-7 M (Diazinon, Zolone, Carbophos, Co-ral, and Metaphos) or n × 10-7-n × 10-5 M (DDVP) with the use of an AKI-Ts-01 analyzer. Test characteristics depend on the nature of the substrate (butyrylcholine iodide or indophenyl acetate) and on the presence of reversible effectors (copper and aluminum salts), which impair the inhibiting effect of organophosphorus compounds. N-Phthalylchitosan affects the sensitivity of cholinesterase to reversible and irreversible inhibitors. This effect may be associated with the formation of stabilizer-metal or stabilizer-enzyme-metal complexes.